

Patent Claims:

1. A process for an improved and gentler release of quality-enhancing constituents from grapes:

said process comprising the following steps:

- A must obtained from red grapes and/or white grapes is heated to/held at a temperature that is above the freezing point for the must and can be adjusted up to temperatures that are standard for the traditional must heating;
- Prior to the pressing operation for producing the young wine, the must is pumped/flows through a device/section of a device and is subjected therein to pulsed electrical fields for the irreversible opening of the walls of the biological cells in the grape skin, the process of electroporation, wherein the pulse duration is in the range of 0.5 - 3µs;
- During the electroporation, the must is subjected to such high-intensity pulsed electrical fields that on the one hand the grape-skin cells with a size of 7 to 10µm experience a potential difference of at least 100 volt while, on the other hand, the streamer-formation limit of approximately 1000kV/cm is not reached;
- The specific energy dose for the electroporation of cells is adjusted to between 10 and 40kJ per kilogram of must, at a must temperature ranging from 10°C to approx. 40°C, and is adjusted upward by a factor of 2 to 4 times for a temperature below approx. 10°C and adjusted downward by a factor of 2 for a temperature above approximately 40 °C;
- Following the electroporation process, the must undergoes a predetermined reactor residence time for releasing the quality-enhancing constituents from the fruit skin into the must, wherein this release is monitored by taking at least one must sample;

- The residence time is followed by a pressing operation for producing the young wine.
2. The process according to claim 1, characterized in that following the electroporation the white-grape must is subjected to a reactor residence time lasting from several minutes to several hours.
3. The process according to claim 1, characterized in that the reactor residence time for the red-grape must ranges from approximately 1 hour to several days, following the electroporation.
4. The process according to one of the claims 2 and 3, characterized in that the must for producing the young wine is at most subjected to a pressure that equals the pressure traditionally used for this process.
5. The process according to claim 4, characterized in that the must is moved continuously or in batches through the device/the section of the device used for the electroporation.
6. A young wine produced from grapes, as well as the wine produced therewith, characterized in that for producing this young wine and subsequently the table-ready wine, the must is subjected at least in part to the process step of electroporation as disclosed in one of the claims 1 to 5.
7. A device for carrying out the electroporation of a grape must, characterized in that

- The device/the section of the device for electroporation comprises a dielectric pipe, which represents the flow channel for the must and has a simple round or simple polygonal, but at least four-cornered cross section, wherein at least two spaced-apart electrodes are installed in the pipe wall for generating a pulsed, electrical field between the electrodes;
 - The electrodes are installed countersunk or flush with the wall or such that they project into the flow channel;
 - The complete surface area of the blank electrode surfaces projecting into the flow channel functions to control/delimit the flow between the electrodes, wherein the clear cross section and the length of the flow channel for the device are designed such that the must as electrolytic load of the device has an electrical resistance which at most equals the impedance of a high-voltage pulse generator connected to the device.
8. The device according to claim 7, characterized in that the electrodes are positioned opposite each other, at an angle/offset to the flow axis, or in pairs perpendicular to the flow axis, and that in the case of more than two electrodes, these are oriented toward the flow axis or are positioned sequentially and spaced apart around the flow axis.
9. The device according to claim 7, characterized in that the electrodes are ring-shaped and follow successively, coaxial to the flow axis.

10. The device according to claim 7, characterized in that the electrodes are pin-shaped and follow each other along the flow axis, while spaced apart, or are positioned in a row in rotational direction around the flow axis.

11. The device according to one of the claims 8 to 10, characterized in that the front of the respective electrode, which is exposed to the flow channel, has a rounded contour, such that with a pulsed field generation, at most an electrical field intensity of 1000kV/cm can at any time be generated on all contour regions of the electrode and that the exposed electrode geometry does not initiate a backup in the flow of the must.

12. The device according to one of the claims 8 to 11, characterized in that the flow channel and the therein installed electrodes are composed of an inert material that is suitable for processing food items, or that at least the surfaces coming in contact with the must are coated with this material.